$$g_i(\mathbf{x}) = -\frac{1}{2}(\mathbf{x} - \mu_i)^t \Sigma_i^{-1}(\mathbf{x} - \mu_i) - \frac{d}{2}\ln 2\pi - \frac{1}{2}\ln |\Sigma_i| + \ln P(\omega_i).$$

Function implemented using python and numpy library.

Output :

```
Ajay      Assignment_1    master    3.9.5    68ms    python .\q1.py
Classifying using ['X1', 'X2', 'X3']
-----------------------------
        Class :  W1
-----------------------------
Data : [-5.01 -8.12 -3.68]    has discrimant values : [-8.896633809823308, -9.88817975608594, -inf]
Data : [-5.43 -3.48 -3.54]    has discrimant values : [-8.380368820190116, -9.086847524317832, -inf]
Data : [ 1.08 -5.52  1.66]    has discrimant values : [-8.696399135153273, -10.44212420367123, -inf]
Data : [ 0.86 -3.78 -4.11]    has discrimant values : [-8.117617338652945, -8.204471062638994, -inf]
Data : [-2.67  0.63  7.39]    has discrimant values : [-10.039699579216572, -9.839417323355564, -inf]
Data : [4.94 3.29 2.08]       has discrimant values : [-8.664748617614082, -9.084333447057679, -inf]
Data : [-2.51  2.09 -2.59]    has discrimant values : [-8.838004769487373, -9.252075168083989, -inf]
Data : [-2.25 -2.13 -6.94]    has discrimant values : [-8.4467764863018, -10.14781383536225, -inf]
Data : [ 5.56  2.86 -2.26]    has discrimant values : [-9.080104919492628, -8.211502811737601, -inf]
Data : [ 1.03 -3.33  4.33]    has discrimant values : [-8.45356356333091, -10.700224253186827, -inf]
-----------------------------
        Class :  W2
-----------------------------
Data : [-0.91 -0.18 -0.05]    has discrimant values : [-7.585277317513043, -7.544399585352882, -inf]
Data : [ 1.3  -2.06 -3.53]    has discrimant values : [-7.846665956190101, -7.8212055023902955, -inf]
Data : [-7.75 -4.54 -0.95]    has discrimant values : [-9.4110336140548, -8.81419038835612, -inf]
Data : [-5.47  0.5   3.92]    has discrimant values : [-10.229902144055115, -8.23655530854852, -inf]
Data : [ 6.14  5.72 -4.85]    has discrimant values : [-10.85428300857288, -9.85730404949939, -inf]
Data : [3.6  1.26 4.36]       has discrimant values : [-8.414694173068652, -10.03956186019262, -inf]
Data : [ 5.37 -4.63 -3.65]    has discrimant values : [-10.64358361941817, -9.661553242781624, -inf]
Data : [ 7.18  1.46 -6.66]    has discrimant values : [-11.190739701294477, -8.754199762674341, -inf]
Data : [-7.39  1.17  6.3 ]    has discrimant values : [-12.932665824657631, -9.077300186316512, -inf]
Data : [-7.5  -6.32 -0.31]    has discrimant values : [-9.360549599407276, -8.897435594682868, -inf]
-----------------------------
        Class :  W3
-----------------------------
Data : [5.35 2.26 8.13]       has discrimant values : [-9.991895299316537, -14.434735104130306, -inf]
Data : [ 5.12  3.22 -2.66]    has discrimant values : [-9.072874631436813, -8.272233019592495, -inf]
Data : [-1.34 -5.31 -9.87]    has discrimant values : [-9.798091960007037, -11.734499522794485, -inf]
Data : [4.48 3.42 5.19]       has discrimant values : [-9.027174553065072, -10.732274844880582, -inf]
Data : [7.11 2.39 9.21]       has discrimant values : [-11.057221710778796, -17.361500644794614, -inf]
Data : [ 7.17  4.33 -0.98]    has discrimant values : [-9.819173799246725, -8.902291742799473, -inf]
Data : [5.75 3.97 6.65]       has discrimant values : [-9.774239856066542, -12.636213438627136, -inf]
Data : [0.77 0.27 2.41]       has discrimant values : [-7.73786349077869, -8.148671095950368, -inf]
Data : [ 0.9  -0.43 -8.71]    has discrimant values : [-9.434155259587472, -10.70663930259655, -inf]
Data : [ 3.52 -0.36  6.43]    has discrimant values : [-9.027041608622904, -12.418751584809874, -inf]
```